



AMENDMENT UNDER 37 C.F.R. §1.111
U.S. APPLN .NO.: 10/025,821

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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): An ink cartridge for an ink-jet recording apparatus comprising:
 - a container body having an ink supply port;
 - a storage element disposed on said container body;
 - electrodes to be in contact with respective contacts provided in the recording apparatus accommodating the container body therein; and
 - a recess located between the ink supply port and the electrodes and is adapted to contact a protrusion of said recording apparatus to maintain the electrodes in contact with respective contacts,
 - wherein the recess includes a first width along a carriage moving direction, the protrusion includes a second width along the carriage moving direction, the first width and the second width being substantially the same, and
 - recess receives the protrusion to align the electrodes with respective contacts in a carriage moving direction in a state in which the electrodes contact the contacts.
2. (previously presented): The ink cartridge according to claim 1, wherein the recess includes at least one recess that has an opening at a leading end thereof in an ink cartridge insertion direction, and that is engageable with the protrusion.

3. (withdrawn): The ink cartridge according to claim 2, wherein the at least one recess includes a pair of recesses located opposite from each other with respect to the electrodes.

4. (original): The ink cartridge according to claim 2, wherein the recess has an upper end wall to be contacted with an upper end of the protrusion.

5. (original): The ink cartridge according to claim 4, wherein the wall extends in parallel to a direction in which the electrodes are arranged.

6. (previously presented): The ink cartridge according to claim 4, wherein a contact area between the wall and the recess is wider than a width of an area in which the electrodes are arranged.

7. (withdrawn): The ink cartridge according to claim 1, wherein the positioning system includes a blind hole opened at a bottom surface of the container body.

8. (withdrawn): The ink cartridge according to claim 1, wherein the storage element and the electrodes are mounted on a same flexible cable.

9. (previously presented): An ink cartridge for an ink-jet recording apparatus, comprising:

a container body having an ink supply port;

electrodes which are to be in contact with respective contacts provided in the recording apparatus and which are formed in a side where the ink supply port is provided;

a storage element provided to a predetermined area of the container body and connected to the electrodes; and

a positioning recessed portion open to the side where the ink supply port is provided, and receives a protruding portion formed in the recording apparatus to maintain the electrodes in

contact with respective contacts, the positioning recessed portion having a first width along a carriage moving direction, the protruding portion having a second width along the carriage moving direction, wherein the first width and the second width are substantially the same,

wherein the positioning recessed portion contacts the positioning member to align the electrodes with respective contacts in a carriage moving direction in a state in which the electrodes contact the contacts.

10. (original): The ink cartridge according to claim 9, wherein a circuit board having the electrodes is accommodated in a recessed portion formed in said container body.

11. (original): The ink cartridge according to claim 9, wherein said positioning recessed portion is formed at a position below a circuit board having the electrodes.

12. (withdrawn): The ink cartridge according to claim 9, wherein a pair of the positioning recesses are provided to be located opposite from each other with respect to the electrodes.

13. (original): The ink cartridge according to claim 9, wherein said container body has a recessed portion for accommodating a circuit board having the electrodes, and has a wall which defines said recessed portion and is brought into contact with a top surface of said protruding portion.

14. (original): The ink cartridge according to claim 13, wherein the wall extends in parallel to a direction in which the electrodes are arranged.

15. (previously presented): The ink cartridge according to claim 13, wherein a contact area between the wall and the protruding portion is wider than a width of an area where the electrodes are arranged.

16. (original): The ink cartridge according to claim 9, wherein the storage element is mounted on a circuit board.

17. (withdrawn): The ink cartridge according to claim 9, wherein a flexible cable is connected to a circuit board having the electrodes, and the storage element is connected to the electrodes through the flexible cable.

18. (withdrawn): The ink cartridge according to claim 17, wherein the storage element is mounted on the flexible cable.

19. (withdrawn): The ink cartridge according to claim 9, wherein the storage element and the electrodes are mounted on a same flexible cable.

20. (previously presented): The ink cartridge according to claim 1, wherein the recess contacts the protrusion to further align the electrodes with respective contacts in at least one direction of a paper feeding direction and a vertical direction in a state in which the electrodes contact the contacts.

21. (previously presented): The ink cartridge according to claim 9, wherein the positioning recessed portion contacts the positioning member to further align the electrodes with respective contacts in at least one direction of a paper feeding direction and a vertical direction in a state in which the electrodes contact the contacts.

22. (previously presented): The ink cartridge according to claim 1, wherein the recess is located at an edge portion where a bottom wall formed with the ink supply port meets a side wall formed with the electrodes.

23. (previously presented): The ink cartridge according to claim 1, wherein the recess extends from a bottom wall formed with the ink supply port to reach at least a lower end of a circuit board having the electrodes.

24. (previously presented): The ink cartridge according to claim 22, wherein the recess extends from the bottom wall formed with the ink supply port to reach at least a lower end of a circuit board having the electrodes.

25. (previously presented): An ink cartridge for an ink-jet recording apparatus having a protrusion and contact electrodes, comprising:

a container body having an ink supply port;

a storage element associated with said container body;

a recess disposed at a bottom of the ink cartridge, having an opening along an insertion direction of the ink cartridge, wherein a width of the opening along a direction perpendicular to the insertion direction and parallel to a carriage moving direction is substantially equal to a width of the protrusion along the direction perpendicular to the insertion direction and parallel to the carriage moving direction; and

cartridge electrodes disposed at a side of the ink cartridge, contacting respective contact electrodes provided in the recording apparatus accommodating the ink jet cartridge therein,

wherein the recess contacts the protrusion to align the cartridge electrodes with respective contact electrodes in a carriage moving direction in a state in which the cartridge electrodes contact the contact electrodes.

26. (previously presented): The ink cartridge according to claim 25, wherein the protrusion fitted into the recess fixedly maintains electrical contact between the cartridge electrodes and respective contact electrodes.

27. (previously presented): The ink cartridge according to claim 25, wherein the cartridge electrodes are on a circuit board and the recess is disposed substantially on a centerline of the circuit board and the centerline of the circuit board is coincident with a centerline of the ink jet cartridge.

28. (withdrawn): The ink cartridge according to claim 25, wherein a the cartridge electrodes are on a circuit board and the recess is disposed substantially on a centerline of the circuit board and the centerline of the circuit board is offset from a centerline of the ink jet cartridge.

29. (withdrawn): The ink cartridge according to claim 25, wherein the recess is a first recess of a plurality of recesses and the protrusion is a first protrusion of a plurality of protrusions.

30. (withdrawn): The ink cartridge according to claim 29, wherein each of the plurality of recesses is disposed at the bottom of the ink cartridge, an opening of each of the plurality of recesses is disposed along the insertion direction of the ink cartridge, and a width of the opening of each of the plurality of recesses along a main scanning direction is substantially equal to a width of a respective one of the plurality of protrusions along the main scanning direction.

31. (withdrawn): The ink cartridge according to claim 30, wherein the cartridge electrodes are disposed between the first recess and a second recess of the plurality of recesses along the main scanning direction.

32. (previously presented): An ink cartridge for an ink-jet recording apparatus comprising:

- a container body having an ink supply port;
- a storage element disposed on said container body;
- electrodes to be in contact with respective contacts provided in the recording apparatus accommodating the container body therein; and
- a recess located proximate the electrodes and adapted to contact a protrusion of said recording apparatus to maintain the electrodes in contact with respective contacts along at least a carriage moving direction,

wherein the recess includes a first horizontal width along the carriage moving direction, the protrusion includes a second horizontal width along the carriage moving direction and the first width and the second width are substantially the same.

33. (currently amended): An ink cartridge according to claim 32, wherein ~~the~~ each of the electrodes has a third horizontal width along the carriage moving direction substantially equal to or greater than a difference between the first horizontal width of the recess and the second horizontal width of the protrusion.

34. (previously presented): The ink cartridge according to claim 33, wherein the first horizontal width is a distance between two vertical walls of the recess and the second horizontal distance is a distance between the two vertical walls of the protrusion.

35. (previously presented): The ink cartridge according to claim 34 further comprising a slit disposed behind the ink supply port and adapted to receive a projecting member of the recording apparatus, wherein the recess is disposed in front of the ink supply port.

36. (previously presented): The ink cartridge according to claim 33 further comprising a front retaining member disposed above the electrodes at a front side of the container body.

37. (previously presented): The ink cartridge according to claim 36 further comprising a back retaining member disposed at a back side of the container body.

38. (withdrawn): The ink cartridge according to claim 37 further comprising a slit disposed behind the ink supply port and adapted to receive a projecting member of the recording apparatus, wherein the positioning system is disposed in front of the ink supply port and the recording apparatus has a spring disposed behind the projecting member, engaging the ink cartridge between the slit and the back retaining member.

39. (previously presented): The ink cartridge according to claim 32, wherein the carriage moving direction is perpendicular to a paper feeding direction and a cartridge insertion direction.

40. (previously presented): The ink cartridge according to claim 32, wherein the recess comprises a first sidewall and a second sidewall, the first sidewall opposes the second sidewall, and the protrusion is received in the recess.

41. (previously presented): The ink cartridge according to claim 32 further comprising a slit disposed behind the ink supply port and adapted to receive a projecting member of the recording apparatus, wherein the recess is disposed in front of the ink supply port.

42. (previously presented): The ink cartridge according to claim 1, wherein the recess comprises a first sidewall and a second sidewall, the first sidewall opposes the second sidewall, and the protrusion is received in the recess.

43. (previously presented): The ink cartridge according to claim 9, wherein the positioning recessed portion comprises a first sidewall and a second sidewall, the first sidewall opposes the second sidewall, and the protruding portion is received in the recess.

44. (withdrawn): The ink cartridge according to claim 32, wherein the positioning system includes a pair of side walls disposed adjacent to the electrodes so that the electrodes are located between the side walls in the carriage moving direction.

45. (withdrawn): The ink cartridge according to claim 44, wherein the side walls are defined respectively by inner walls of recesses formed in the container body.

46. (withdrawn): An ink cartridge comprising:
a container body having a front surface and a bottom surface, at least a part of said bottom surface lying in a plane;
a first groove and a second groove, both formed in said front surface, said first and second grooves extending together in parallel in a direction away from said bottom surface;
a circuit board mounted to said front surface at a location such that, when the ink cartridge is seen in a front view, at least a portion of said circuit board being located between said first and second grooves; and
a plurality of electrodes arranged on said circuit board.

47. (withdrawn): An ink cartridge as claimed in claim 46, wherein said electrodes are arranged in row, and said row is perpendicular to said direction away from said bottom surface.

48. (withdrawn): An ink cartridge as in claim 46, wherein said circuit board has a portion located furthest from said bottom surface, said first and said second grooves each having

an end, and at least one of said ends lies approximately on a line extending through said portion of said circuit board and parallel to said plane.

49. (withdrawn): An ink cartridge as claimed in claim 48, wherein both said ends lie approximately on said line.

50. (withdrawn): An ink cartridge as claimed in claim 46, wherein said first and second grooves are symmetrically disposed about a centerline of said circuit board.

51. (withdrawn): An ink cartridge as claimed in claim 46, wherein said electrodes lie in a plane that is substantially perpendicular to said plane in which said bottom surface lies.

52. (withdrawn): An ink cartridge as in claim 46, wherein at least one of said first and second grooves is rectangular in cross-section.

53. (withdrawn): An ink cartridge comprising;
a container body having a front surface and a bottom surface, at least a part of said bottom surface lying in a plane, and a pair of parallel grooves formed in said front surface to define a region therebetween;

a circuit board mounted to said front surface at a position such that at least a portion of said circuit board is located in said region between said parallel grooves; and

a plurality of electrodes arranged on said circuit board.

54. (withdrawn): An ink cartridge as claimed in claim 53, wherein substantially all of said electrodes are located in said region.

55. (withdrawn): An ink cartridge as claimed in claim 53, wherein said electrodes are arranged in a row, and said row is perpendicular to said parallel grooves.

56. (withdrawn): An ink cartridge as claimed in claim 53, wherein said circuit board has a portion located furthest from said bottom surface, said parallel grooves each has an end, and at least one of said ends lies approximately on a line extending through said portion of said circuit board and parallel to said plane.

57. (withdrawn): An ink cartridge as claimed in claim 56, wherein both said ends lie approximately on said line.

58. (withdrawn): An ink cartridge as claimed in claim 53, wherein said parallel grooves are symmetrically disposed about a centerline of said circuit board.

59. (withdrawn): An ink cartridge as claimed in claim 53, wherein said electrodes lie in a plane that is substantially perpendicular to said plane in which said bottom surface lies.

60. (withdrawn): An ink cartridge as claimed in claim 53, wherein at least one of said parallel grooves is rectangular in cross-section.